

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-108439
(43)Date of publication of application : 30.04.1996

(51)Int.Cl. B29C 43/18
B29C 43/20
B32B 27/12
B60R 13/02
// B29K105:08
B29L 9:00
B29L 31:58

(21)Application number : 06-274506
(22)Date of filing : 12.10.1994

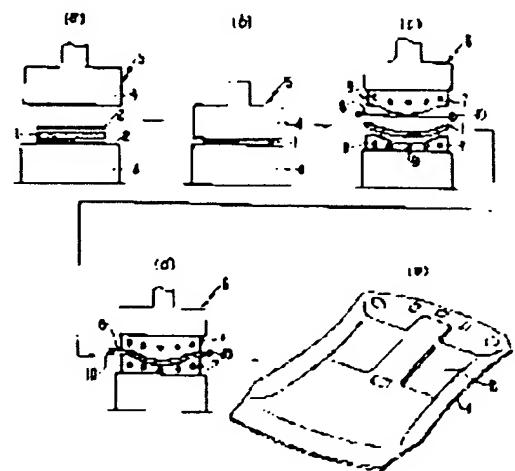
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(54) PRODUCTION OF MOLDED CEILING BASE MATERIAL FOR CAR

(57)Abstract:

PURPOSE: To produce a lightweight molded ceiling base material for a car excellent in heat stability and rigidity in low cost.

CONSTITUTION: A natural fiber and a thermoplastic fiber are mixed to be formed into bulky felt with definite thickness by a dry fiber lamination method of an air laid system or a layer system and thermoplastic films 2 are superposed on both surfaces of the bulky felt 1 and the whole is held between the flat plates of a press machine 5 and heated to the melting temp. of the thermoplastic fiber and the thermoplastic films 2. Thereafter, the bulky felt 1 is set to molds 7, 7 of which the molding surfaces are formed into a required ceiling curved surface along with a skin material 8 to be compressed and cooled.



LEGAL STATUS

[Date of request for examination] 04.06.1998

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number] 2974581

[Date of registration] 03.09.1999

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] Mix with cotton a natural fiber and thermoplastic fiber, and the bulky felt of fixed thickness is formed with dry-type fiber laminated layers methods, such as an air RAID method or a layer method. After making both sides of this bulky felt carry out the polymerization of the thermoplastic film and heating on both sides of this at the melting temperature of said thermoplastic fiber and a thermoplastic film to a flatbed press machine, The manufacture approach of the shaping head-lining base material for automobiles characterized by setting this bulky felt with epidermis material at the die with which the shaping side was formed in the necessary head-lining curved surface, compressing, and cooling.

[Claim 2] The manufacture approach of the shaping head-lining base material for automobiles according to claim 1 characterized by carrying out the polymerization of paper or the nonwoven fabric to a thermoplastic film, and making both sides of bulky felt carry out the polymerization of this thermoplastic film so that this paper or a nonwoven fabric may serve as an outside.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the approach of manufacturing the shaping head-lining base material for automobiles.

[0002]

[Description of the Prior Art] The manufacture approach as shown in the shaping head-lining base material for automobiles from the former at ** of a degree - ** is learned.

** That on which this is set to a bonded type with epidermis material, such as a nonwoven fabric and a fabric, and this epidermis material is pasted up after making it distribute as a binder in natural fibers, such as hemp and cotton, carrying out heating pressurization with a die and fabricating thermosetting resin like phenol resin in the shape of necessary toothing.

** What fabricates a tabular shaping head-lining base material by carrying out extrusion molding of the thermoplastics.

** The shaping head-lining base material of the foam sandwich structure which comes to prepare a film layer in both sides of foaming tabular material, such as styrene.

[0003]

[Problem(s) to be Solved by the Invention] However, while two molds of a die and a bonded type were needed and the manufacture approach of the above-mentioned ** took two processes, since molding temperature had to be made into 200 degrees C or more which thermosetting resin fuses, it was that to which a conversion cost, a labor cost, etc. become high from the reasons of the necessary heating up time of a die becoming long. moreover, the shaping head-lining base material by the above-mentioned ** will become it is thick and heavy, in order to acquire necessary rigidity, and also the dimension contraction after thermoforming is size -- etc. -- there is a problem. heating conditions -- furthermore, by the above-mentioned **, take to the temperature up by things and heating with uniform heating difficult since a sheet is thermoplastic foam to a core, and a sheet carries out drawdown -- very much -- severe -- for example, an INFU raster in heater -- since an expensive heating facility like a highly precise temperature controller is needed, there are problems, like an initial cost is high and the dimension contraction after shaping of a product is large.

[0004]

[Means for Solving the Problem] The manufacture approach of the shaping head-lining base material for automobiles of this invention is what is going to solve the above-mentioned technical problem. Mix with cotton a natural fiber and thermoplastic fiber, and the bulky felt of fixed thickness is formed. After making both sides of this bulky felt carry out the polymerization of the thermoplastic film and heating on both sides of this at the melting temperature of said thermoplastic fiber and a thermoplastic film to a flatbed press machine, It is characterized by setting this bulky felt with epidermis material at the die with which the shaping side was formed in the necessary head-lining curved surface, compressing, and cooling. As the above-mentioned natural fiber, there are specifically hemp, cotton, a bamboo, a palm coconut, etc. Moreover, there are polypropylene, polyethylene, etc. as thermoplastic fiber.

[0005] Moreover, it is characterized by for this invention carrying out the polymerization of paper or the nonwoven fabric to a thermoplastic film in the manufacture approach of the above-mentioned shaping head-lining base material for automobiles, and making both sides of bulky felt carry out the polymerization of this thermoplastic film so that this paper or a nonwoven fabric may serve as an outside.

[0006]

[Function] Thermoplastic fiber and a thermoplastic film weld to a natural fiber, and a shaping head-lining base material with lightweight and high rigidity can be manufactured. And since the bulky felt of the shape of a

heated sheet can be fabricated by the low voltage force with the die maintained at the temperature near ordinary temperature, installation costs, such as metal mold and press equipment, are mitigated, and a running cost can also be mitigated.

[0007]

[Example] Next, one example of this invention is explained with a drawing. A series of fiber laminating machines for manufacturing bulky felt 1 with a fiber laminated layers method to drawing 1 are shown. this drawing -- setting -- A -- a fiber feeder and B -- a cotton-mixing machine and C -- a feeder -- a column and D are [a needle punch machine and F of an air RAID laminating machine and E] reels. As well as a natural fiber with a hempen fiber length of 38-65mm, thermoplastic fiber, such as a polypropylene fiber with a fiber length of 38-65mm, is supplied to the cotton-mixing machine B from the fiber feeder A. this after 1:1 coming out of both fiber comparatively and mixing with cotton to homogeneity by letting it pass to this cotton-mixing machine B -- further -- a feeder -- a column -- by feeding into the air RAID laminating machine D from C The amounts 500-1000g of eyes/m² It adjusts so that it may become the shape of felt of fixed thickness, and he is trying to roll round bulky felt 1 to Reel F by letting it pass to the needle punch machine E. And as shown in drawing 2, the polymerization of the thermoplastic film 2 is carried out to both sides of this bulky felt 1. As for this thermoplastic film 2, paper or a nonwoven fabric 3 is stuck on one side of an olefin system film with a thickness of 10-50 micrometers. And both sides of bulky felt 1 are made to carry out the polymerization of this thermoplastic film 2 so that this nonwoven fabric 3 may serve as an outside.

[0008] And these heating pressurization boards 4 and 4 of the press machine 5 that have the flatbed heating pressurization boards 4 and 4 of a pair as shown in drawing 3 (a) and (b) are beforehand heated at about 200-220 degrees C. The above-mentioned bulky felt 1 is inserted between this heating pressurization board 4 and 4 (60 or less seconds is desirable.). It pressurizes at the same time it heats this bulky felt 1 at about 180 degrees C, and it is made the thickness of 4-6mm. Thus, bulky felt 1 can be heated to homogeneity by using the flatbed heating pressurization boards 4 and 4. With this heating, the thermoplastic fiber in bulky felt 1 half-fuses, also fuses a natural fiber, and slag and the thermoplastic film 2, and welds to these fiber. In addition, since it does not fuse, if a nonwoven fabric 3 is easy, it closes mold release with the heating pressurization boards 4 and 4.

[0009] Subsequently, as shown in drawing 3 (c), with a heating condition, the above-mentioned bulky felt 1 is set to the molding press 6 with the epidermis material 8, and is compressed with dice 7 and 7, and it cools. The water flow way 9 for these dice 7 and 7 to make the interior circulating through cooling water while the shaping side is formed in the necessary head-lining curved surface is formed. This molding press 6 compresses bulky felt 1 into about 3-4mm in thickness, and is 2 - 10 kg/m². Since it is good, the low voltage press machine which can be pressed by the light pressure force of extent does not take an installation cost so much.

[0010] In addition, by the adhesive film's (hot mel film's) having laminated at the rear face, such as a nonwoven fabric and a fabric, and being held between a die 7 and 7 by the frame 10, closing these dice 7 and 7, as shown in drawing 3 (d), and carrying out a polymerization to bulky felt 1, this adhesive film melts with the remaining heat of this bulky felt 1, and the epidermis material 8 pastes up this epidermis material 8 on the front face of bulky felt 1. And while this bulky felt 1 is fastened and compressed into these dice 7 and 7, it can manufacture a shaping head-lining base material as shown in drawing 3 (e) and drawing 4 by carrying out a mold aperture in the place which heat is taken and cooled, is in a melting condition, and thermoplastics solidified, and taking this out from a mold face.

[0011] There is also an advantage which the allophone of a contact sound with the car body according to vibration since this nonwoven fabric etc. comes to touch a perimeter when it attaches in an automobile, while raising the rigidity of a shaping head-lining base material, since it closed if [as mentioned above / in mold release] by sticking paper or a nonwoven fabric 3 on the thermoplastic film 2 beforehand, and also elasticity was smaller than the thermoplastic film 2, rather than the thermoplastic film 2 touches directly can be made hard to generate in the car.

[0012] in addition, the above-mentioned air RAID laminating machine D -- a feeder -- a column -- although it is the method which carries out an adsorption laminating and forms a felt mat on the screen by which flew the fiber supplied from C according to the force of RIKAIN and a wind, and the vacuum was carried out, the fiber laminated layers method by the layer method which forms a web for the supplied fiber with a card, turns up and lays it on top of many layers, and builds a felt mat may use.

[0013]

[Effect of the Invention] Thus, since the shaping head-lining base material concerning this invention is made from the cotton-mixing felt of natural fibers, such as hemp obtained by the dry-type fiber laminated layers method by a series of fiber laminating machines, and thermoplastic fiber, it is lightweight, excellent in thermal stability, and since it moreover comes to carry out the polymerization of the thermoplastic film to the both

sides, it has the property which expected rigidity was acquired and was excellent as a shaping head-lining base material for automobiles. And since it can fabricate by heating on both sides of the bulky felt with a flatbed press machine, and setting and compressing into a die with epidermis material to epidermis pasting and coincidence, a production process is simplified sharply and there are various advantages -- facility cost is also mitigable.

[Translation done.]

(19)日本国特許庁 (JP)

(12) 公開特許公報 (A)

(11)特許出願公開番号

特開平8-108439

(43)公開日 平成8年(1996)4月30日

(51)Int.Cl. ⁶	識別記号	府内整理番号	F 1	技術表示箇所
B 29 C 43/18		7365-4F		
	43/20	7365-4F		
B 32 B 27/12		9349-4F		
B 60 R 13/02	A			
// B 29 K 105:08				

審査請求 未請求 請求項の数2 FD (全4頁) 最終頁に続く

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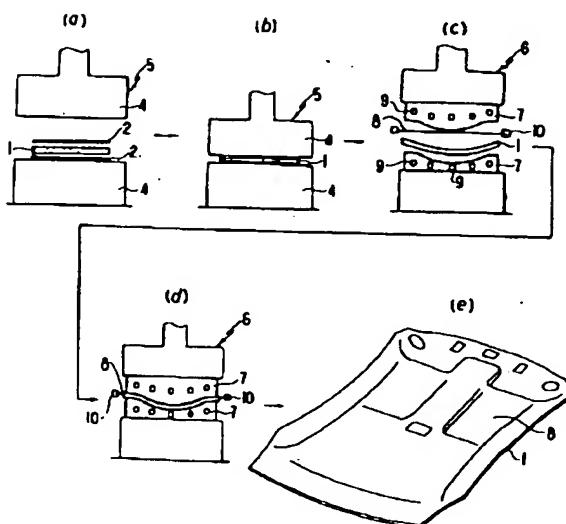
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(54)【発明の名称】自動車用成形天井基材の製造方法

(57)【要約】

【目的】軽量で熱安定性、剛性に優れた自動車用成形天井基材を低成本で製造する。

【構成】天然繊維と熱可塑性繊維とを混綿しエアレイド方式またはレイヤー方式等の乾式の繊維積層法により一定厚さの嵩高フェルト1を形成し、該嵩高フェルト1の両面に熱可塑性フィルム2を重合させてこれを平盤状のプレス機5に挟んで前記熱可塑性繊維および熱可塑性フィルム2の溶融温度に加熱した後、該嵩高フェルト1を成形面が所要天井曲面に形成された成形型7、7に表皮材8とともにセットして圧縮し冷却する。



【特許請求の範囲】

【請求項1】 天然繊維と熱可塑性繊維とを混綿しエアレイド方式またはレイヤー方式等の乾式の繊維積層法により一定厚さの嵩高フェルトを形成し、該嵩高フェルトの両面に熱可塑性フィルムを重合させてこれを平盤状のプレス機に挟んで前記熱可塑性繊維および熱可塑性フィルムの溶融温度に加熱した後、該嵩高フェルトを成形面が所要天井曲面に形成された成形型に表皮材とともにセットして圧縮し冷却することを特徴とした自動車用成形天井基材の製造方法。

【請求項2】 紙または不織布を熱可塑性フィルムに重合し、該熱可塑性フィルムを該紙または不織布が外側となるように嵩高フェルトの両面に重合させることを特徴とした請求項1に記載の自動車用成形天井基材の製造方法。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は自動車用の成形天井基材を製造する方法に関する。

【0002】

【従来の技術】 自動車用成形天井基材には従来から次の①～③に示したような製造方法が知られている。

①エノール樹脂のような熱硬化性樹脂を麻、綿などの天然繊維中にバインダーとして分散させて成形型により加熱加圧して所要凹凸形状に成形した後、これを不織布、ファブリック等の表皮材とともに接着型にセットし該表皮材を接着させるもの。

②熱可塑性樹脂を押出成形することにより板状の成形天井基材を成形するもの。

③スチレン等の発泡板状材の両面にフィルム層を設けてなる発泡体サンドイッチ構造の成形天井基材。

【0003】

【発明が解決しようとする課題】 しかし上記①の製造方法では、成形型と接着型との2つの型を必要とし2工程を要すると共に、成形温度を熱硬化性樹脂の溶融する200℃以上にしなければならないので成形型の所要昇温時間が長くなるなどの理由から加工費、人件費等が高くなるものであった。また上記②による成形天井基材は、所要の剛性を得るために厚くて重いものになるほか、熱成形後の寸法収縮が大であるなどの問題がある。さらに上記③では、シートが熱可塑性発泡体であるため中心部までの均一な加熱が困難であることと加熱による昇温に連れてシートがドローダウンするなど加熱条件が非常に厳しく、例えば、インフラスタインヒータ高精度な温度制御装置のような高価な加熱設備を必要とするので、インシャルコストが高く、また、製品の成形後の寸法収縮が大きい等の問題がある。

【0004】

【課題を解決するための手段】 本発明の自動車用成形天井基材の製造方法は上記課題を解決しようとするもの

で、天然繊維と熱可塑性繊維とを混綿して一定厚さの嵩高フェルトを形成し、該嵩高フェルトの両面に熱可塑性フィルムを重合させてこれを平盤状のプレス機に挟んで前記熱可塑性繊維および熱可塑性フィルムの溶融温度に加熱した後、該嵩高フェルトを成形面が所要天井曲面に形成された成形型に表皮材とともにセットして圧縮し冷却することを特徴とする。上記天然繊維としては具体的には麻、綿、竹、バームヤシ等がある。また、熱可塑性繊維としてはポリプロピレン、ポリエチレン等がある。

10 【0005】 また本発明は上記自動車用成形天井基材の製造方法において、紙または不織布を熱可塑性フィルムに重合し、該熱可塑性フィルムを該紙または不織布が外側となるように嵩高フェルトの両面に重合させることを特徴とする。

【0006】

【作用】 热可塑性繊維および热可塑性フィルムが天然繊維に融着し、軽量で高い剛性を有した成形天井基材を製造できる。しかも加熱したシート状の嵩高フェルトを常温に近い温度に保たれた成形型により低圧力で成形できるので、金型、プレス装置等の設備費が軽減され、ランニングコストも軽減できる。

【0007】

【実施例】 次に図面と共に本発明の一実施例を説明する。図1に嵩高フェルト1を繊維積層法により製造するための一連の繊維積層機械を示す。同図において、Aは繊維フィーダー、Bは混綿機、Cは給綿塔、Dはエアレイド積層機、Eはニードルパンチ機、Fは巻取機である。麻等の繊維長3.8～6.5ミリの天然繊維と、同じく繊維長3.8～6.5ミリのポリプロピレン繊維等の熱可塑性繊維を繊維フィーダーAから混綿機Bに供給し、該混綿機Bに通すことにより両繊維を1:1の割合で均一に混綿した後、これをさらに給綿塔Cからエアレイド積層機Dに送給することで、目付量500～1000g/m²の一定厚さのフェルト状となるように調整し、ニードルパンチ機Eに通すことにより巻取機Fに嵩高フェルト1を巻取るようにしている。そしてこの嵩高フェルト1の両面に図2に示したように熱可塑性フィルム2を重合する。この熱可塑性フィルム2は10～50μmの厚さのオレフィン系フィルムの片面に紙または不織布3が貼り合わされたものである。そして該不織布3が外側となるように嵩高フェルト1の両面に該熱可塑性フィルム2を重合させる。

40 【0008】 そして図3(a)、(b)に示したように一対の平盤状の加熱加圧盤4、4を有しているプレス機5の該加熱加圧盤4、4を200～220℃程度に予め加熱しておき、上記嵩高フェルト1を該加熱加圧盤4、4間に挟んで(60秒以下が好ましい。)該嵩高フェルト1を180℃程度に加熱すると同時に加圧して4～6mmの厚さにする。このように平盤状の加熱加圧盤4、4を使用することにより嵩高フェルト1を均一に加熱す

ることができる。この加熱によって嵩高フェルト1中の熱可塑性繊維が半溶融して天然繊維とからみ、熱可塑性フィルム2も溶融してこれらの繊維に融着する。なお不織布3は溶融しないので加熱加圧盤4、4との離型を容易ならしめる。

【0009】次いで図3(c)に示したように、上記嵩高フェルト1を加熱状態のまま表皮材8とともに成形プレス6にセットし成形型7、7にて圧縮し冷却する。該成形型7、7は成形面が所要天井曲面に形成されていると共に、内部に冷却水を循環させるための通水路9が形成されたものである。該成形プレス6は嵩高フェルト1を厚さ3~4ミリ程度に圧縮するものであって2~10kg/m²程度の軽圧力で押圧し得る低圧プレス機でよいので設備費はさほど要しない。

【0010】なお表皮材8は、不織布、ファブリック等の裏面に接着フィルム(ホットメルフィルム)がラミネートされたもので、フレーム10により成形型7、7間に保持され、該成形型7、7を図3(d)に示したように閉じて嵩高フェルト1と重合させることにより該嵩高フェルト1の余熱により該接着フィルムが溶けて該表皮材8を嵩高フェルト1の表面に接着させる。そして該嵩高フェルト1は該成形型7、7に挟着されて圧縮されると同時に型面より熱が奪われて冷却され溶融状態にあって熱可塑性樹脂が固化したところで型開きしてこれを取出すことにより、図3(e)および図4に示したような成形天井基材が製造できる。

【0011】熱可塑性フィルム2に紙または不織布3を予め貼り合わせておくことにより前述のように離型を容易ならしめるほか、熱可塑性フィルム2よりも伸縮性が小さいので成形天井基材の剛性を向上させると共に、自動車に取付けた場合に周囲に該不織布等が接するようになるので、熱可塑性フィルム2が直接接するよりも振動による車体との接触音の異音が車内に発生しにくくなる利点もある。

【0012】なお、上記エアロイド積層機Dは給綿塔Cより供給された繊維をリカインと風の力により飛ばしバ

キュームされたスクリーン上に吸着積層してフェルトマットを形成する方式であるが、供給された繊維をカードによりウェブを形成しそれを何層にも折返して重ね合わせてフェルトマットをつくるレイヤー方式による繊維積層法を用いてもよい。

【0013】

【発明の効果】このように本発明に係る成形天井基材は、一連の繊維積層機械による乾式の繊維積層法によって得られる麻等の天然繊維と熱可塑性繊維との混綿フェルトを素材とするので軽量で熱安定性に優れ、しかもその両面に熱可塑性フィルムを重合してなるので所期の剛性が得られ自動車用成形天井基材として優れた特性を有する。しかも、嵩高フェルトを平盤状のプレス機にて挟んで加熱して成形型に表皮材とともにセットし圧縮することで表皮貼付と同時に成形できるので、製造工程が大幅に簡略化され設備コストも軽減できるなど種々の利点がある。

【図面の簡単な説明】

【図1】本発明の一実施例に係る繊維積層機械の概略図。

【図2】本発明の一実施例を示す嵩高フェルトの部分断面図。

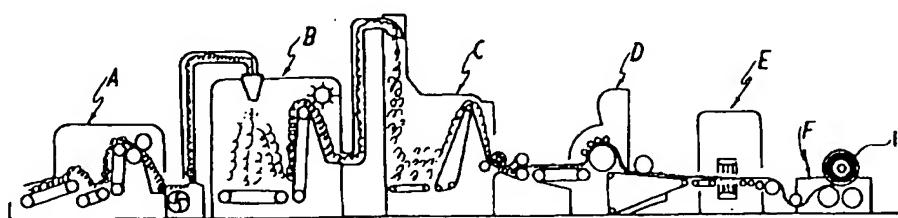
【図3】本発明に係る自動車用成形天井基材の製造方法の工程図。

【図4】本発明に係る自動車用成形天井基材の部分断面図。

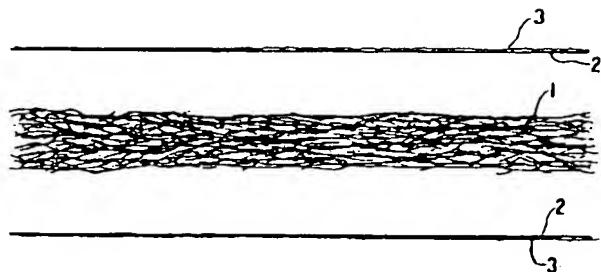
【符号の説明】

1	嵩高フェルト
2	熱可塑性フィルム
3	不織布
4, 4	加熱加圧盤
5	プレス機
6	成形プレス
7, 7	成形型
8	表皮材
9	通水路

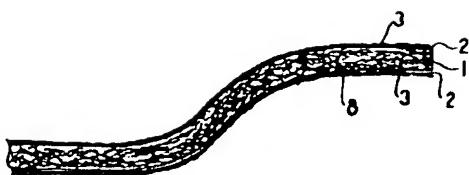
【図1】



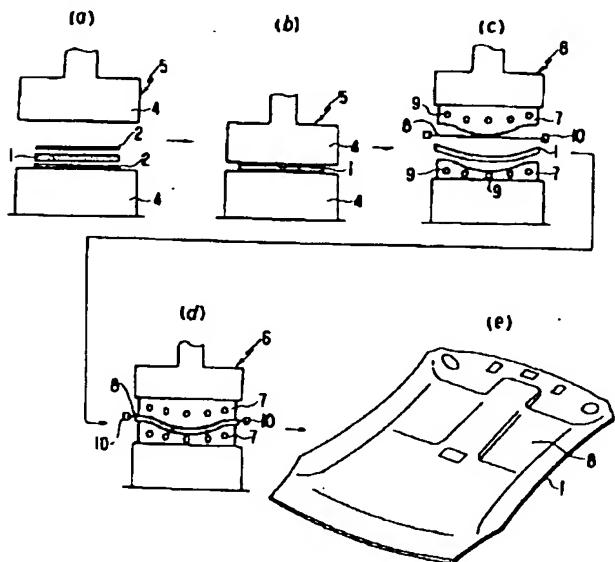
【図2】



【図4】



【図3】



フロントページの続き

(51) Int. Cl. 6

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31:58

識別記号

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技術表示箇所